



CBARR NEWS

Edgewood Chemical Biological Center

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*A worldwide leader
in CB solutions*



When the Hon. Heidi Shyu visited Team CBRNE, the U.S. Army Edgewood Chemical Biological Center (ECBC) demonstrated its beginning-to-end lifecycle support for science, engineering and operation solutions. We set the stage for our commitment to the Warfighter and characterized our support for larger Department of Defense efforts with a sound readiness to counter chemical and biological threats and provide safe solutions for demilitarization efforts. ECBC's Chemical Biological Application and Risk Reduction (CBARR) Business Unit was recognized for providing onsite sample analysis in Umatilla, Ore., implementing new safety policies that lower the risk of injury, and spurring creative innovation by using existing resources in new ways. It's all here, all the time. But especially this May.

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Assistant Secretary of the Army for Acquisition, Logistics and Technology visits ECBC on May 1



The Honorable Heidi Shyu

The Hon. Heidi Shyu, the assistant secretary of the Army for Acquisition, Logistics and Technology, visited ECBC on May 1 to tour facilities, meet with subject matter experts and share lunch with employees in order to gain first-hand knowledge about the organization's mission to the Army and national defense community.

"It was a great opportunity for ECBC to showcase the full breadth of the work we do here at the Center, from basic and applied research through lifecycle sciences to engineering and operations solutions," said Tom Rosso, CBARR program manager. Rosso, pictured above, provided Shyu with insight on ECBC's rapid prototyping capabilities for weapons of mass destruction elimination.

The visit included an Edgewood Area Team CBRNE overview meeting that included leadership from ECBC, Joint Program Executive Office for Chemical and Biological Defense, 20th Support Command, Army Medical Research Institute of Chemical Defense, Public Health Command, Chemical Materials Activity and Program Executive Office, Assembled Chemical Weapons Alternatives.

Shyu is the primary advisor to the Secretary of the Army on all matters involving acquisition, logistics and technology, including ECBC's research and development efforts for the Army and the JPEO-CBD programs. She also oversees the Elimination of Chemical Weapons program.

No-cut safety gloves lower risk of onsite injury

Application Integration Branch adopts protective equipment

ABERDEEN PROVING GROUND, Md. — When Phil Rice, a chemical engineering technician at ECBC, tests and replaces filter systems in buildings across the Edgewood Area of Aberdeen Proving Ground, he is fully dressed in personnel protective equipment, or PPE. The impermeable Tyvek coveralls, nitrile and butyl gloves, Toxicological Agent Protective (TAP) boots and M40 masks are common items that protect against highly toxic chemical contamination threats. However, this type of PPE does not protect against physical hazards, such as the sharp metal edges around filter units.

“The sharp edges of the stainless steel filters would cut right through a brand new pair of standard butyl gloves that we were using. The Application Integration Branch was looking for ways to avoid hand-cutting accidents and decided to have a trial run with the Kevlar gloves,” said Rice, a team leader for CBARR. ECBC started using cut-resistant Kevlar gloves in 2011. “We’ve been using them ever since and have had no more cuts.”

ECBC’s Industrial Safety Committee conducted an Industrial Incident Evaluation of hand injuries that occurred across the Center in 2009. The type of gloves used and the severity of resulting injuries were evaluated to identify specific hand and arm hazards, and determined an appropriate PPE solution. A number of gloves, including cotton, insulated, Kevlar, leather, cuffed leather, shock absorbing and padded, were all rated on performance when handling a variety of material. Kevlar provided the highest rated hand protection for 12 of the 17 materials, including sharps, sheet metal, rough edges, glass and metal, and performed well in heavy cutting and heavy clean-up situations.

There were 12 hand injuries in 2009, eight of which were lacerations. The Kevlar gloves that Rice and his team have been using onsite have improved safety since then. Hand injuries, which comprised 42 percent of all recordable injuries across the Center in 2009, only resulted in one of the 20 recordable injuries in 2012. The Industrial Incident Evaluation report also obtained feedback from employees regarding the gloves’ comfort, dexterity, worker confidence, durability and productivity.

“The downside to any glove is the dexterity. You just don’t have it,” Rice said. “Again, that’s with any glove. You lose your dexterity when trying to pick things up, but the Kevlar gloves are

tight fitting and provide a better grip than most.”

Rice is the team leader for a six-person media crew that changes all of the filter systems of Edgewood Area buildings that work with chemical agents. A typical filter system uses negative pressure to pull air through fume hoods located in rooms inside a given building before it is exhausted outside. According to Rice, when air travels through the units, a pre-filter catches all of the large particulates and then moves through HEPA, or high-efficiency particulate air, filter.

Phil Santee, of the ECBC Safety and Health Office, said that the HEPA filter removes particulates at an efficiency of 99.97 percent. “Anything larger than three microns is trapped in the filter through several different methods: impaction, interception and diffusion,” Santee said.

As a result, all particulates, such as biological agents and radiological particles are captured by the HEPA filters. The air is then pulled through a carbon filter that catches all of the toxic chemical vapors and gases before it is finally filtered through a second set of HEPA filters prior to being released to the outside atmosphere.

“The pre-filters and the HEPAs get changed once a year, and the HEPAs are tested afterward to ensure their integrity. We don’t change out the carbon filters, but we do test those every two years. If they pass our tests then they are good for another two years. If not, we change them out on a failure basis only,” said Rice. “Testing consists of introducing a known gas on the front side of the filter, running a machine on the backside and looking for any breakthrough to ensure the filter is working properly.”

According to Rice, the number of filter systems a building has depends on the number of hoods inside the building. Rice works closely with building supervisors to ensure minimal disturbance of laboratory testing schedules. The cut-resistant Kevlar gloves equip employees with the proper protection needed

to sustain onsite operations. Due to the threat and use of chemical and biological agents, testing the integrity of filter systems across the Edgewood Area is one of ECBC’s primary missions that ensures the safety and environmentally-sound work of the organization.



A Umatilla chemical agent worker used cut-resistant gloves during onsite closure activities and recently transitioned from leather gloves to improve safety and reduce hand lacerations.

Employee Profile: PHIL RICE



**CBARR Chemical Engineering Technician
Application Integration Branch**

Q: How long have you worked at ECBC?

A: I’ve been at ECBC since 1990, or 23 years.

Q: What’s your favorite part about working for CBARR?

A: Working with a wide variety of personnel.

Q: How would you define the role of team leader?

A: An individual that sets a good example for others to follow. My favorite phrase is “lead by example.”

Q: What is the most challenging part about the work you do?

A: The most challenging part is operating with the known dangers of the job, which is why safety is always paramount in our job analysis.

Q: What is the most rewarding part?

A: Knowing that at the end of the day, our team has done everything in its power to ensure lab workers have a healthy work environment with clean air to breathe.

For more information on ECBC Safety, visit:
[Safety and Health Office, Industrial Safety](#)

GPL monitoring nears completion at Umatilla

Inventory list for onsite monitoring equipment adds value to transportable support

HERMISTON, Ore. – Supporting a larger quest to establish a legacy of environmental responsibility in northeast Oregon, CBARR has safely sampled, monitored and analyzed 58 hazardous waste management units, or igloos, at the Umatilla Chemical Agent Disposal Facility (UMCDF), some of which stored chemical agents.

CBARR has been at the Umatilla Chemical Depot monitoring igloos before the contract was switched to the Chemical Materials Activity (CMA). Through a unique Cooperative Research and Development Agreement, CBARR and site contractor URS Federal Services continued the relationship to monitor in accordance with the UMCDF Hazardous Waste Permit and then to close the igloos in accordance with the Closure Plan.

CBARR began the General Population Limit (GPL) monitoring project in November 2012 and finished on May 21, 2013. Real-time Analytical Platforms (RTAPs) are mobile vehicles equipped with Depot Area Air Monitoring Systems (DAAMS) and Miniature Continuous Air Monitors (MINICAMS), and were used onsite to examine the interior atmosphere for potential hazards. Mustard Igloos Temperature Conditioning Systems (MITECs) were also used onsite to heat the igloos to about 80 degrees Fahrenheit and clear the structure of any chemicals present, specifically nerve agents GB (sarin), VX and blister agent HD (mustard).

“MITECs are big heaters that are staged inside the igloo,” said Satchell Doyle, CBARR chemical engineer and Umatilla project manager. “They heat the inside of the structure to at least 80 degrees. Two RTAP operators then use the DAAMS and MINICAMS to monitor the atmosphere to make sure it is not hazardous. After 12 hours at 80 degrees Fahrenheit, a sample is collected shipped back to ECBC at Aberdeen Proving Ground, Md., where CBARR conducts GPL analysis.”

The sampling methodology used in GPL monitoring requires the utmost accuracy due to the extreme sensitivity of this kind of work, said Doyle. Common challenges include background interference from trace organophosphate pesticides, hydrocarbons and other airborne chemicals in the ambient air. Trained and experience CBARR personnel ensure these challenges are met with precision, supporting a larger demilitarization effort that requires the safe decontamination and clearing of igloos located on the depot.

According to Doyle, four CBARR employees operated the RTAPs and MITECs in a supporting effort to contractor URS as the UMCDF/UMCD Closure Plan transitions the land to the state of Oregon. Final approval of the UMCDF Closure Plan was granted by the Oregon Department of Environmental Quality (DEQ) on Jan. 17, 2013.

According to a press release from contractor URS in January, chemical agent destruction operations were completed in October 2011. Since then, the UMCDF team has worked to decontaminate and decommission onsite buildings, including the Munitions Demilitarization Building, where chemical agents and weapons were processed. CBARR supports URS in the closure effort using state-of-the-art monitoring equipment to assess and confirm the chemical agent hazard has been alleviated prior to turnover.

(CONTINUED P.6)



From igloo monitoring to hazardous waste shipment, CBARR supports beginning-to-end remediation processes for onsite customers.

Detect-Identify-Decontaminate

A photograph of a white C-130 cargo aircraft on a tarmac. The aircraft is viewed from a low angle, showing its nose and wings. A star insignia is visible on the side of the fuselage. The background shows bare trees and a clear sky.

ABERDEEN PROVING GROUND, Md. — Aircraft decontamination is a complex, challenging process in the aftermath of a biological attack. Returning assets to an active status requires that the decontaminants used are effective, yet nondestructive to aircraft interior surfaces, sensitive equipment and electronics.

The Rapid Detect-Identity-Decontaminate Kit is designed for spore-forming bacteria and decontamination of suspected areas. Utilizing ECBC assets that include CBARR test beds and biological decontamination methodologies, the C-130 cargo aircrafts, barcoded spore technology and conceptual model design and animation for the kit prototype, the project will provide the means for developing a solution for the hazard mitigation arena.

The kit concept resulted from a previous multi-directorate collaboration between Debbie Menking, CBARR project manager, and Sofi Ibrahim, Ph.D., a microbiologist in ECBC's Research and Technology Directorate who conducted decontamination biological efficacy assessments at ECBC for the Joint Project Manager-Protection. Now, the methodologies and success from that project have grown into another cross-directorate opportunity for ECBC that will explore decontamination efficacy inside aircrafts.

"Leveraging momentum from the decon testing in order to take it to the next level was our goal. The Section 219 funding provided the means to drive the development of the proposed kit forward using tri-directorate assets to explore how effective a Detect-Identify-Decontaminate process could work against biological agent hazards inside an aircraft," Menking said.

Section 219 funding comes from the National Defense Authorization Act of 2009, which allows military and government research laboratories to tax customers up to 3 percent of all revenue sources as an indirect fee that helps finance the overall cost of a given project. The proposed kit was awarded funds from the funding after meeting the required proposal criteria: innovation, collaboration and potential transition to the Warfighter. It was one of nine ECBC projects that effectively met ECBC's Threat Goal Team objective of maintaining awareness of emerging threats and was subsequently awarded the 219 funding, as announced on March 27.

"CBARR will complete the test execution of the decontamination trials, and the C-130 aircrafts are an ECBC capability that nobody else has. Having the ability to walk into an aircraft for testing is unparalleled for most other agencies," said Jerry Pfarr, branch chief of CBARR's Biological Operations Branch.

(CONTINUED P.7)

ECBC CONNECTION

**May is
Military Appreciation
Month!**



DID YOU KNOW?

CBARR makes up

35%

**of all news, features and
press releases published
on the ECBC public
website.**

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MAY forecasts



WEATHER AROUND THE WORLD

CBARR LOCATIONS

Aberdeen Proving Ground, Md.
Pine Bluff Arsenal, Ark.
Washington, D.C.
Deseret Chemical Depot, Utah
Umatilla, Ore.
Redstone Arsenal
Melbourne, Australia

AVG. HIGH (F) AVG. LOW (F) AVG. PRECIP. (in)

72 53 3.95
82 61 4.84
75 56 3.99
72 48 2.43
72 48 0.77
81 59 5.11
62 49 2.70

★ CBARR Star Aaron Sredin ★



Chemical Engineering Technician
ECBC employee since 2004

**"I absolutely love doing this. I like to go
in there and help people, and know
that it's made a big impact on them."**

*-Aaron Sredin on creating an RTAP inventory list for
customers*

(CONTINUED FROM P.4)

Aaron Sredin, CBARR chemical engineering technician and RTAP operator, was responsible for conducting weekly "first-entry" surveillance tests on the igloos, six of which had agent contaminated waste items that were shipped to Port Arthur, Texas for incineration. In addition to the task, Sredin put together an inventory list of all the items that supported equipment used by the RTAPs, including generators, gas chromatographs and heaters.

"If we were going to use these RTAPs anywhere else, what would I need?" Sredin recalled. "I pulled out every item that I deemed necessary for each of the six instruments that we were using inside three RTAPs onsite. I categorized everything from quantity to part number."

According to Sredin, the equipment holds up fairly well during operations, but it is likely that filters for the hydrogen and nitrogen air generators may need to be replaced depending upon the humidity in a given location. The inventory list saved URS valuable time in determining which parts were necessary for onsite work, whether it is the UMCDF or the U.S. Army Pueblo Chemical Depot, where the RTAP equipment may be used.

"I absolutely love doing stuff like this. I like to go in there and help people, and know that it's made a big impact on them," Sredin said. "It's my job, but it's also my pleasure to make sure it goes well for people, and the inventory list is something that can be directly used in Pueblo."

CBARR support to Umatilla will officially end once the GPL monitoring of igloos is completed at the end of May. Sredin called the project a "great success and a very enjoyable job with great people to work with."

Kit for biological agent hazard mitigation wins Section 219 funding

(CONTINUED FROM P.5)

According to Pfarr, the C-130s enable CBARR to advance its biological decontamination capability and begin the six-month testing immediately. The biggest challenge, he said, will be generating the results and delivering the program in a way that will attract interest from the right agencies in order to build the future of aircraft decontamination programs at ECBC.

“Our hope is that we generate enough interest from some of the major funding organization to create opportunities that will get the C-130s back on the radar and make it known that this capability is here at ECBC, which is located in close proximity to many of these agencies,” Pfarr said.

Using the proposed kit, a hazard mitigation team sent inside the aircraft would be able to accurately assess the situation, presumptively identify the agent and determine proper decontamination steps.

According to Menking, if somebody opened up an envelope and a powder came out, first responders would go in with their Detect-Identify-Decon kit using hand-held assays for presumptive identification of contamination as the first step in spot-checking around the aircraft.

“What of kind contamination do you have? Is it ricin? It is anthrax? The beauty of the project is its potential to expand the concept to build decon kits for toxins, bacterial spores, bacterial vegetative cells and viruses. We have tested a decon technology that we know is effective against all three classes of organisms,” said Menking.

Decontamination testing will occur on surfaces inside the aircraft as well as on coupons of chemical agent resistant coating (CARC) painted steel. Barcoded spores from ECBC’s Research and Technology (R&T) Directorate simulate anthrax and will be deposited on the surfaces to illustrate the presence of contamination. Next, the surfaces will be decontaminated with the decontaminate, and according to Menking, should show either a lower level of the simulant or nothing at all in order to fully demonstrate an effective decontamination process.

The developing kit has the potential to impact real world situations in a variety of environments that may be exposed to suspected contamination or serve as a potential hazard mitigation

tool if a spore or powder were to be released on a commercial jet liner. Proof of concept for this kind of decontamination method will lead to a conceptual rendering of the kit with potential for development of a prototype kit in future studies.

Jeff Warwick, branch chief for the Engineering Directorate’s Conceptual Modeling and Animation branch, is leading a team to create virtual prototype concepts and supplemental visual communications for the kit during the six-month testing phase.

“Engineers will be brought in to work with CBARR and advise, based on past experiences with other projects, what are some

things to consider in the prototyping process,” said Warwick. “For example, the durability and packaging material for those kits could be different depending on whether they will be used on the battlefield or in the homeland.”

The kit will include government-off-the-shelf (GOTS) hand-held assays for rapid identification and consist of assembling commercial-off-the-shelf (COTS) components to decontaminate interior surfaces of the aircraft. ECBC acquired the C-130s from Little Rock Air Force Base in 2011 as part of joint effort between CBARR and the Joint Program Manager-Protection, but initial plans to study decontamination systems for chemical and biological agents were dismissed due to budget restraints.

Now, 219 funding has afforded ECBC the chance to explore the biological aspect in a new way, with center-wide capabilities that were not available two years ago. By expanding opportunities for funding across the Center, research projects can begin to thrive in places that are

typically difficult to generate new business leads.

“The 219 funding is for ‘good ideas’ projects. Somebody might have a really good idea that can benefit the Warfighter or homeland defense, but without any funding it would be difficult to prove without a prototype,” Warwick said. “Once this is developed and we have a prototype, ECBC can showcase its benefits, conduct an analysis of its technical capability and seek real funding opportunities.”

In June, the ECBC team will design experiments to be tested through August, which will assess detecting sensitivity and decontamination efficacy. A final report will be presented in September.





U.S. Army named Top 100 Global Innovators of 2012

The U.S. Department of the Army was named one of the Thomson Reuters Top 100 Global Innovators in 2012, recognizing its efforts in innovative approaches to global defense. Also named was the U.S. Department of the Navy, marking the first time government agencies made the elite list. According to the official report, these two government entities were recognized for their significant investment in innovation, with efforts strongly focused on national security.

In 2012, ECBC was awarded 20 patents, including a patent for the design of an Explosive Destruction System (EDS) Fragment Removal Tool that improves safety during an operation. The portable tool assists technicians with the removal of heavy, difficult-to-handle fragments left over from an EDS operation. Previously, CBARR operators manually removed the extremely heavy fragments, putting them at risk for injuries, especially the lower back, due to lifting heavy weights. Now, the Fragment Removal Tool assists in removing the deformed fragments onto a table where workers can safely disassemble the fragments into manageable pieces.

In total, the U.S. Army had 436 published inventions, with 327 awarded with a patent. According to the Thomson Reuters report, "the Thomson Reuters Top 100 Global Innovator companies are world leaders of innovation and economic growth." The research cites the U.S. Department of the Army with having a higher percentage of innovative work than the healthcare, pharmaceutical and media/internet industries, among others.

CBARR by the numbers

[592]

DAAMS samples completed at ECBC in April, increased from 429 in March.

[2,043]

Headspace and work place samples analyzed from Deseret Chemical Depot during the last 60 days.

[974]

Environmental samples analyzed by the Environmental Chemical Monitoring Laboratory in April.

[2,249]

Total number of deployed days for all CBARR employees from January-April 2013.

The CBARR labs have been pretty busy during the last two months, analyzing samples from around the world and across the country. More than 3,210 samples have been processed from sites across the nation, including Spring Valley, Pine Bluff Arsenal and Deseret Chemical Depot. Not to mention, 380 samples were processed for the current work being done in Melbourne, Australia. G'day, mate!



For more information about CBARR's mission, visit:
<http://www.ecbc.army.mil/cbarr>



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